

## CLAIMS

1. A computer program product tangibly embodied on an information carrier, the product comprising instructions operable to cause data processing apparatus to:
  - display a table of data as an element of a graphical user interface display, display
  - 5 including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;
  - receive from the user an input gesture selecting a marker;
  - 10 establish the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order;
  - sort the data using the sort key order; and
  - display the sorted data.
- 15 2. The product of claim 1, wherein the user input gesture is a selecting gesture for selecting the marker.
3. The product of claim 1, wherein the user input gesture comprises a pointing device action on the marker.
4. The product of claim 1, wherein the user input gesture is a mouse click on the
- 20 marker.
5. The product of claim 1, wherein the user input gesture is a double mouse click on the marker.
6. The product of claim 1, further comprising instructions to:
  - represent the sort key order visually in the table by displaying the markers with a
  - 25 pattern of distinct visual properties.
7. The product of claim 6, wherein the pattern of distinct visual properties indicates the sort key order.

8. The product of claim 6, wherein the pattern of distinct visual properties comprises a set of distinct colors.

9. The product of claim 6, wherein the instructions to represent the sort key order visually comprise instructions to display the markers that are associated with sort keys  
5 with distinct background colors.

10. The product of claim 6, wherein the pattern of distinct visual properties comprises a set of distinct non-textual representations of the sort key order.

11. The product of claim 1, further comprising instructions to:

determine whether the user-selected marker is associated with the most significant  
10 key, and if so, change a sort direction of the most significant key, and otherwise establish the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order.

12. The product of claim 1, wherein the user input gesture is a dragging gesture for selecting the marker by dragging the marker to an area on the graphical user interface  
15 display.

13. The product of claim 12, wherein the area on the graphical user interface display comprises an icon.

14. The product of claim 12, wherein the area on the graphical user interface display comprises a sort key list window.

20 15. The product of claim 1, wherein the number of sort keys for the table of data is limited to a predetermined number greater than one.

16. The product of claim 15, wherein the table of data has one or more sort keys having a sort key order including a most significant sort key and a least significant sort key, the product further comprising instructions to:

25 determine whether the table of data has the predetermined number of sort keys, and if so, remove the least significant sort key from the sort key order, establish the row or column associated with the user-selected marker as the most significant sort key, and

maintain the positions of the remaining sort keys in the sort key order, and otherwise establish the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order.

5 17. The product of claim 1, further comprising instructions to:

receive from the user an input gesture deselecting a marker associated with a sort key; and

remove the sort key associated with the deselected marker from the sort key order while maintaining the positions of the remaining sort keys in the sort key order.

10 18. The product of claim 1, wherein the marker is a column header.

19. The product of claim 1, wherein the marker is a row header.

20. A computer program product tangibly embodied on an information carrier for interacting with a user, the product comprising instructions operable to cause data processing apparatus to:

15 display a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

20 receive from the user an input gesture selecting a marker by dragging the marker to an area of the graphical user interface display;

establish the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order;

25 sort the data using the sort key order; and  
display the sorted data.

21. The product of claim 20, wherein the area of the graphical user interface display is an icon, the product further comprising instructions to:

receive from the user an input gesture selecting the icon, the icon being associated with a sort key list window; and

display, in the sort key list window on the graphical user interface display, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

22. The product of claim 20, wherein the area of the graphical user interface display is a sort key list window, the product further comprising instructions to:

display, in the sort key list window, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

23. A computer program product tangibly embodied on an information carrier for interacting with a user, the product comprising instructions operable to cause data processing apparatus to:

display a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

receive from the user an input gesture selecting a marker by dragging the marker to a location within an area of the graphical user interface display;

establish the row or column associated with the user-selected marker as a sort key having a position in the sort key order defined by the location within the area, and maintain the positions of the remaining sort keys in the sort key order;

sort the data using the sort key order; and

display the sorted data.

24. A computer program product tangibly embodied on an information carrier for interacting with a user, the product comprising instructions operable to cause data processing apparatus to:

represent visually a sort key order for a table of data by displaying on a graphical user interface display one or more markers with a pattern of distinct visual properties.

25. The product of claim 24, wherein the pattern of distinct visual properties indicate the sort key order.

26. The product of claim 24, wherein the pattern of distinct visual properties comprises a set of distinct colors.

5 27. The product of claim 24, wherein the instructions to represent the sort key order visually comprise instructions to display the markers that are associated with sort keys with distinct background colors.

28. The product of claim 24, wherein the pattern of distinct visual properties are distinct non-textual representations of the sort key order.

10 29. The product of claim 24, wherein each marker is associated with a row or each marker is associated with a column of the table of data.

30. The product of claim 24, wherein each marker is a row header.

31. The product of claim 24, wherein each marker is a column header.

32. A method comprising:

15 displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

20 receiving from the user an input gesture selecting a marker;  
establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order;

sorting the data using the sort key order; and

25 displaying the sorted data.

33. The method of claim 32, wherein the user input gesture is a selecting gesture for selecting the marker.

34. The method of claim 32, wherein the user input gesture is a dragging gesture for selecting the marker by dragging the marker to an area on the graphical user interface display.

35. The method of claim 32, further comprising:

- 5       representing the sort key order visually in the table by displaying the markers with a pattern of distinct visual properties.

36. The method of claim 32, further comprising:

      receiving from the user an input gesture deselecting a marker associated with a sort key; and

- 10       removing the sort key associated with the deselected marker from the sort key order while maintaining the positions of the remaining sort keys in the sort key order.

37. A method comprising:

- displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each  
15       marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

      receiving from the user an input gesture selecting a marker;

- determining whether the user-selected marker is associated with the most significant  
20       key, and if so, changing a sort direction of the most significant key, and otherwise establishing the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order;

      sorting the data using the sort key order; and

- 25       displaying the sorted data.

38. A method comprising:

      displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more

sort keys having a sort key order including a most significant sort key and a least significant sort, each sort key being a row or a column of the table, wherein the number of sort keys for the table of data is limited to a predetermined number greater than one;

receiving from the user an input gesture selecting a marker;

5 determining whether the table of data has the predetermined number of sort keys, and if so, removing the least significant sort key from the sort key order, establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order, and otherwise establishing the row or column associated with the user-selected marker as the most  
10 significant sort key, and maintaining the positions of the remaining sort keys in the sort key order;

sorting the data using the sort key order; and

displaying the sorted data.

39. A method comprising:

15 displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

20 receiving from the user an input gesture selecting a marker by dragging the marker to an area of the graphical user interface display;

establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order;

25 sorting the data using the sort key order; and  
displaying the sorted data.

40. The method of claim 39, wherein the area of the graphical user interface display is an icon, the method further comprising:

receiving from the user an input gesture selecting the icon, the icon being associated  
30 with a sort key list window; and

displaying, in the sort key list window on the graphical user interface display, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

41. The method of claim 39, wherein the area of the graphical user interface display is a sort key list window, the method further comprising:

displaying, in the sort key list window, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

42. A method comprising:

displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

receiving from the user an input gesture selecting a marker by dragging the marker to a location within an area of the graphical user interface display;

establishing the row or column associated with the user-selected marker as a sort key having a position in the sort key order defined by the location within the area, and maintaining the positions of the remaining sort keys in the sort key order;

sorting the data using the sort key order; and  
displaying the sorted data.

43. A method comprising:

representing visually a sort key order for a table of data by displaying on a graphical user interface display one or more markers with a pattern of distinct visual properties.

44. Apparatus comprising:

means for displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort



key, each sort key being a row or a column of the table;

means for receiving from the user an input gesture selecting a marker;

means for establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in

5 the sort key order;

means for sorting the data using the sort key order; and

means for displaying the sorted data.

45. Apparatus of claim 44, further comprising:

means for representing the sort key order visually in the table by displaying the  
10 markers with a pattern of distinct visual properties.

46. Apparatus of claim 44, further comprising:

means for receiving from the user an input gesture deselecting a marker associated with a sort key; and

means for removing the sort key associated with the deselected marker from the sort  
15 key order while maintaining the positions of the remaining sort keys in the sort key order.

47. Apparatus comprising:

means for displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data  
20 having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

means for receiving from the user an input gesture selecting a marker;

means for determining whether the user-selected marker is associated with the most significant key, and if so, changing a sort direction of the most significant key, and

25 otherwise establishing the row or column associated with the user-selected marker as the most significant sort key, and maintain the positions of the remaining sort keys in the sort key order;

means for sorting the data using the sort key order; and

means for displaying the sorted data.

48. Apparatus comprising:

means for displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data  
5 having one or more sort keys having a sort key order including a most significant sort key and a least significant sort, each sort key being a row or a column of the table, wherein the number of sort keys for the table of data is limited to a predetermined number greater than one;

means for receiving from the user an input gesture selecting a marker;

10 means for determining whether the table of data has the predetermined number of sort keys, and if so, removing the least significant sort key from the sort key order, establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order, and otherwise establishing the row or column associated with the user-selected  
15 marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order;

means for sorting the data using the sort key order; and

means for displaying the sorted data.

49. Apparatus comprising:

20 means for displaying a table of data as an element of a graphical user interface display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

25 means for receiving from the user an input gesture selecting a marker by dragging the marker to an area of the graphical user interface display;

means for establishing the row or column associated with the user-selected marker as the most significant sort key, and maintaining the positions of the remaining sort keys in the sort key order;

30 means for sorting the data using the sort key order; and

means for displaying the sorted data.

50. Apparatus of claim 49, wherein the area of the graphical user interface display is an icon, the apparatus further comprising:

means for receiving from the user an input gesture selecting the icon, the icon being associated with a sort key list window; and

5 means for displaying, in the sort key list window on the graphical user interface display, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

51. Apparatus of claim 49, wherein the area of the graphical user interface display is a sort key list window, the apparatus further comprising:

10 means for displaying, in the sort key list window, a list of sort keys comprising the one or more sort keys for the table of data having a sort key order including the most significant sort key.

52. Apparatus comprising:

means for displaying a table of data as an element of a graphical user interface  
15 display, display including a set of markers, each marker being associated with a row of the table or each marker being associated with a column of the table, the table of data having one or more sort keys having a sort key order including a most significant sort key, each sort key being a row or a column of the table;

means for receiving from the user an input gesture selecting a marker by dragging  
20 the marker to a location within an area of the graphical user interface display;

means for establishing the row or column associated with the user-selected marker as a sort key having a position in the sort key order defined by the location within the area, and maintaining the positions of the remaining sort keys in the sort key order;

means for sorting the data using the sort key order; and

25 means for displaying the sorted data.

53. Apparatus comprising:

means for representing visually a sort key order for a table of data by displaying on a graphical user interface display one or more markers with a pattern of distinct visual properties.